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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/887,871	06/22/2001	Varouj Amirghanian	1031/204	8028

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EXAMINER

COUNTS, GARY W

ART UNIT	PAPER NUMBER
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1641

DATE MAILED: 03/13/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/887,871

Applicant(s)

AMIRKHANIAN, VAROUJ

Examiner

Gary W. Counts

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02-19-02.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) 32 and 33 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Applicant's election with traverse of Group 1, claims 1-31 in Paper No. 4 is acknowledged. The traversal is on the ground(s) that the language of the limitations in independent claim 32 substantially parallels the language used in independent Claims 1 and 30. Applicant has amended claim 32. However, the claims are still patentably distinct. This is not found persuasive because restriction requirements are set forth for reasons patentable distinction between each independent invention so as to warrant separate classification and search. The record set forth in the previous restriction requirement clearly indicated that the delineated inventions are in fact patentably distinct each from the other or independent from the other. The requirement is still deemed proper and is therefore made **FINAL** for reasons of record.

Specification

The disclosure is objected to because of the following informalities:

On page 1, lines 7 and 9 the blank spaces need to be filled in with the correct application no.

On page 12, line 16, the blank space needs to be filled in with the correct application no.

On page 24, line 17, the blank space needs to be filled in with the correct application no.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 15 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 15 is vague and indefinite. It is unclear if the two fibers are coupled to the same radiation source or if the two fibers are each coupled to a single source each.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-5, 7, 26, 27, and 29-31 are rejected under 35 U.S.C. 102(b) as being anticipated by Taylor et al (Axial-Beam Laser-Excited Fluorescence Detection in Capillary Electrophoresis, Anal. Chem. 1992, vol. 64, 1741-1744).

Taylor et al disclose a detection system for axial-beam laser excited fluorescence detection in capillary electrophoresis. Taylor et al disclose the use of a fiber optic which focuses the excitation laser beam which directs the light along the capillary rather than across it (col 1, page 1741, lines 1-27). Taylor et al also disclose that this fiber is directed into an end of the detection section in proximity to the detection

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zone (col 1, page 1742, lines 8-10). Taylor et al also disclose the use of cladding material and a jacket which surround the fiber for guiding the excitation radiation from the excitation source to the detection zone (col 2, page 1741, lines 12-18). Taylor et al also disclose a means for detecting radiation emission from the detection zone (col 1, page 1742, lines 22-39).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taylor et al in view of Liu et al (US Patent 5,416,879).

See above for teachings of Taylor et al.

Taylor et al differ from the instant invention in failing to teach the tube is made of Teflon and the light transmitting material comprises a gel.

Liu et al disclose Teflon fluoropolymer capillary tubing which has a refractive index in the range of approximately 1.29 to 1.31 (col 4, lines 18-21). This Teflon tubing allows for the channeling light through a light conducting core region which is surrounded or clad by the Teflon fluoropolymer which has a lower refractive index to the light than the material comprising the core and thus allows the propagation of light with negligible losses through an optical fiber (col 3, lines 50-55).

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It would have been obvious to one of ordinary skill in the art to incorporate the use of the Teflon fluoropolymer as taught by Liu et al into the detection system of Taylor et al because Liu et al shows that this Teflon tubing allows for the channeling of light through a light conducting core region which is surrounded or clad by the Teflon fluoropolymer which has a lower refractive index to the light than the material comprising the core and thus allows the propagation of light with negligible losses through an optical fiber.

With respect to the light transmitting material comprising a gel Taylor et al teaches the insertion of the fiber (light transmitting material) into the separation channel (comprised of the gel), thus the light transmitting material comprises a gel.

4. Claims 9-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taylor et al in view of Hazman et al (US Patent 5,625,403).

See above for teachings of Taylor et al.

Taylor et al differ from the instant invention in failing to teach introducing excitation radiation from at least two radiation sources providing radiation at different wavelengths. Taylor et al also fail to teach the use of a beam splitter.

Hazman et al disclose the use of multiple diode lasers (radiation sources), each of which emits a source beam of light of different wavelengths (see abstract). Hazman et al also disclose an optical element that channels the radiation from the different radiation sources. Hazman et al also disclose the use of a beam splitter (see figure 2). The use of the radiation sources, optical element and beam splitter provides a method

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of recording on an optically-sensitive medium and enables the realization of a practical high power optical head (col 2, lines 27-36).

It would have been obvious to one of ordinary skill in the art to incorporate the use of radiation sources, an optical element and a beam splitter as taught by Hazman et al into the detection system of Taylor et al because Hazman et al shows that the use of the radiation sources, optical element and beam splitter provides a method of recording on an optically-sensitive medium and enables the realization of a practical high power optical head.

5. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Taylor et al in view of Hazman et al (US Patent 5,625,403 as applied to claims 1-5, 7, 9-14, and 29-31 above, and further in view of Amirkhanian et al (US Patent 6,184,990).

See above for teachings of Taylor et al in view of Hazman et al.

Taylor et al differ from the instant invention in failing to disclose a means of introducing excitation radiation comprising two fibers directed at the detection zone, wherein each fiber is coupled to one radiation source.

Amirkhanian et al disclose the use of two optical fibers that are utilized for delivery of the excitation from two or more different sources. This arrangement enables multiple fluorescence species in the same sample to be excited at the same time for simultaneous detection.

It would have been obvious to one of ordinary skill in the art to incorporate the use of two optical fibers as taught by Amirkhanian et al into the detection system of Taylor et al because Amirkhanian et al shows that this arrangement enables multiple

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fluorescence species in the same sample to be excited at the same time for simultaneous detection.

6. Claims 16, 17 and 25-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taylor et al in view of Zhu et al (US Patent 5,763,277).

See above for teachings of Taylor et al.

Taylor et al differ from the instant invention in failing to teach a means for axially detecting radiation emission from the detection zone.

Zhu et al disclose a detection system which comprises a capillary tube (col 6, line 46) used for electrophoresis (separation channel) (col 2, lines 49-51) which defines a detection zone. Zhu et al disclose that sample analyte fluorescence is caused to occur by the application of energy (excitation radiation) to sample analytes caused to be present within the system (col 1, lines 62-65, see also figure 1). Zhu et al disclose the use of an axially oriented fiber optic which is directed into an end of the detection section in proximity to the detection zone. Zhu et al disclose that this fiber optic transmits the produced fluorescence (radiation emission) to a detector system (col 3 lines 1-6, see also figure 1). Zhu et al also disclose that the inner diameter of the axially oriented system component is increased at the location of contained axially oriented fiber optic means (col 5, lines 1-3). The use of this fiber optic provides a system of use for inducing and detecting sample analyte(s) identifying fluorescence.

It would have been obvious to one of ordinary skill in the art to incorporate the use of a fiber as taught by Zhu et al (US Patent 5,763,277) into the detection system of

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Taylor et al because Zhu et al shows that the use of this fiber optic provides a system of use for inducing and detecting sample analyte(s) identifying fluorescence.

7. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Taylor et al in view of Zhu et al (US Patent 5,763,277) as applied to claims 1-5, 7, 16, 17, 25-31 above, and further in view of Letcher et al (US Patent 6,326,213).

See above for teachings Taylor et al and Zhu et al.

Taylor et al differ from the instant invention in failing to teach the means for axially detecting radiation emission shares the same single fiber as the means for introducing excitation radiation axially to transmit excitation radiation and radiation emission.

Letcher et al disclose a single step-taperd fiber used for excitation and detection (col 3, lines 1 and 2, see also abstract). The use of this fiber allows for enhancement of the sensitivity of a fiber-optic biosensor using fluorescent immunoassay techniques for the rapid detection of a pathogen.

It would have been obvious to one of ordinary skill in the art to incorporate the fiber of Letcher et al into the detection system of Taylor et al because Letcher et al shows that the use of this fiber allows for enhancement of the sensitivity of a fiber-optic biosensor using fluorescent immunoassay techniques for the rapid detection of a pathogen.

8. Claims 19-22, are rejected under 35 U.S.C. 103(a) as being unpatentable over Taylor et al in view of Zhu et al (5,763,277), and Letcher et al (US Patent 6,326,213) as

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applied to claims 1-5, 7, 16-18, and 25-31 above, and further in view of Hazman et al (US Patent 5,625,403).

See above for teachings of Taylor et al, and Zhu et al, and Letcher et al.

Taylor et al differ from the instant invention in failing to disclose a confocal optical element that transmits excitation radiation and radiation emission.

Hazman et al disclose the use of a dichroic beam combiner along with a set of lens. This dichroic beam combiner is used to selectively reflect and transmit light according to its wavelength (col 4, lines 30-33). The use of the beam combiner and set of lens allows for the combination of laser beams and enabling the realization of a practical high power optical head.

It would have been obvious to one of ordinary skill in the art to incorporate the beam combiner and set of lens as taught by Hazman et al into the detection system of Taylor et al because Hazman et al shows that the use of the beam combiner allows for selectivity of light reflection and transmission according to its wavelength and the beam combiner and set of lens also allows for the combination of laser beams and enabling the realization of a practical high power optical head.

9. Claims 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taylor et al in view of Pentoney, Jr. et al (US Patent 5,675,155).

See above for teachings of Taylor et al.

Taylor et al differ from the instant invention in failing to teach the use of a parabolic reflective collector.

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Pentoney, Jr. et al (US Patent 5,675,155) disclose the use of a high collection efficiency parabolic reflector (col 5, lines 14-39). The use of this parabolic reflector allows for an economical highly sensitive, stable and rugged detection system for use in connection with high throughput separation systems and also allows for multiple excitation wavelengths and detecting multiple emission wavelengths using a single detector (col 2, lines 24-32).

It would have been obvious to one of ordinary skill in the art to incorporate the use of a parabolic reflector as taught by Pentoney, Jr. et al into the detection system of Taylor et al because Pentoney, Jr. et al shows that the use of this parabolic reflector allows for an economical highly sensitive, stable and rugged detection system for use in connection with high throughput separation systems and also allows for multiple excitation wavelengths and detecting multiple emission wavelengths using a single detector.

Double Patenting

10. Claims 1-31 provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-18 of copending Application No. 09/887,953. Although the conflicting claims are not identical, they are not patentably distinct from each other because It would have been obvious to one of ordinary skill in the art to incorporate the radiation in certain directions in order to optimize the measurement of the signal.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

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Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Yeung et al ((Multiplexed Fluorescence Detector for Capillary Electrophoresis Using Axial Optical Fiber Illumination) discloses multiplexed detection in capillary electrophoresis.

Yeung et al (US Patent 5,498,324) disclose a fluorescence detector system for capillary electrophoresis wherein a laser can substantially simultaneously excite fluorescence in analyte in multiple capillaries and a detector can substantially simultaneously monitor separations of analytes.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gary W. Counts whose telephone number is (703) 305-1444. The examiner can normally be reached on M-F 8:00 - 4:30.

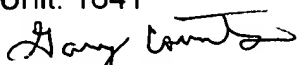
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on (703) 305-3399. The fax phone numbers for the organization where this application or proceeding is assigned are (703)308-4242 for regular communications and (703)3084242 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0196.

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Gary W. Counts

Examiner

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March 1, 2002



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03/1/02